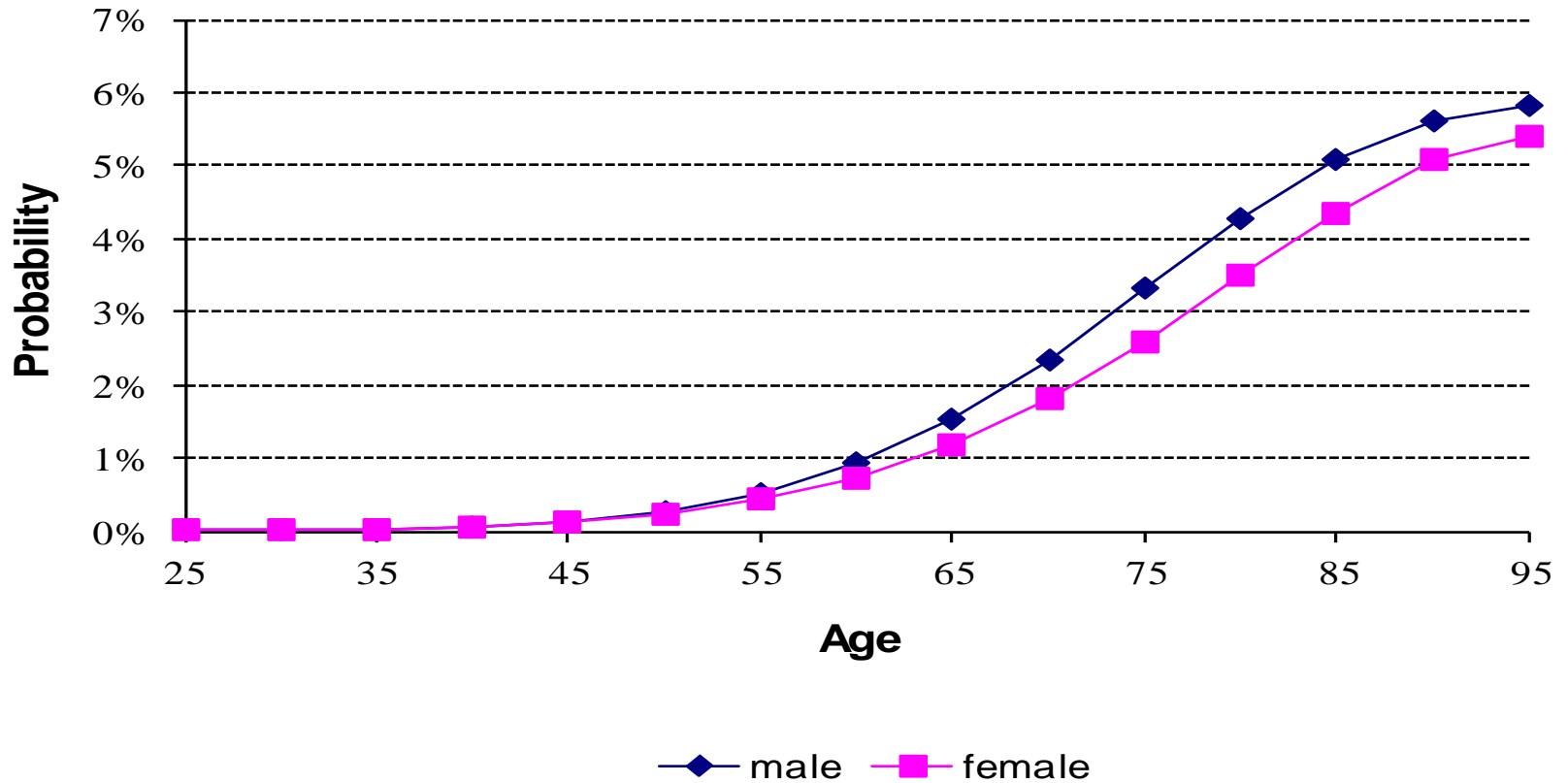


Provider Level Analyses of Receipt of Colorectal Cancer Screening (mostly colonoscopy)

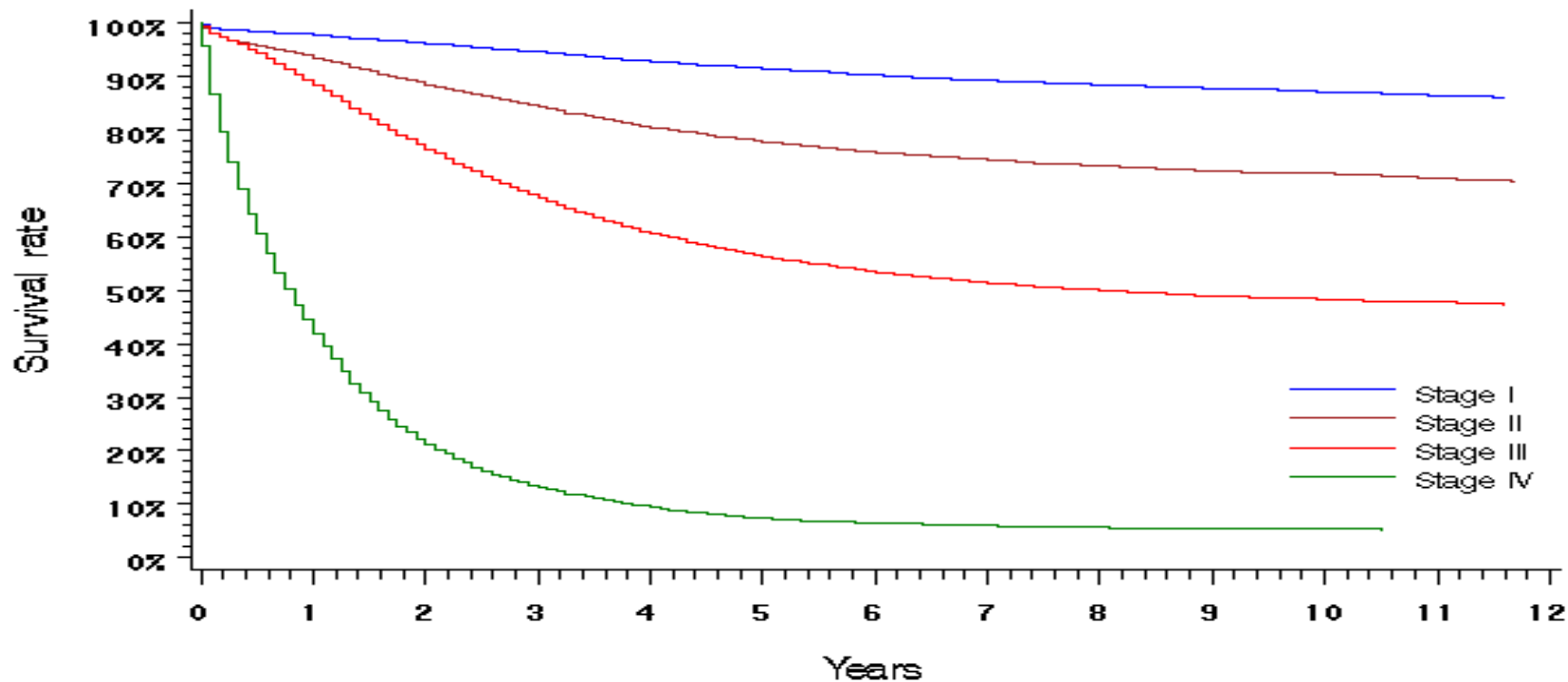
James S. Goodwin, MD
George and Cynthia Mitchell
Distinguished Chair in Geriatric Medicine
Director, Sealy Center on Aging

Life Time Risk of Developing Colo-rectal Cancer

U.S. SEER Registry Data

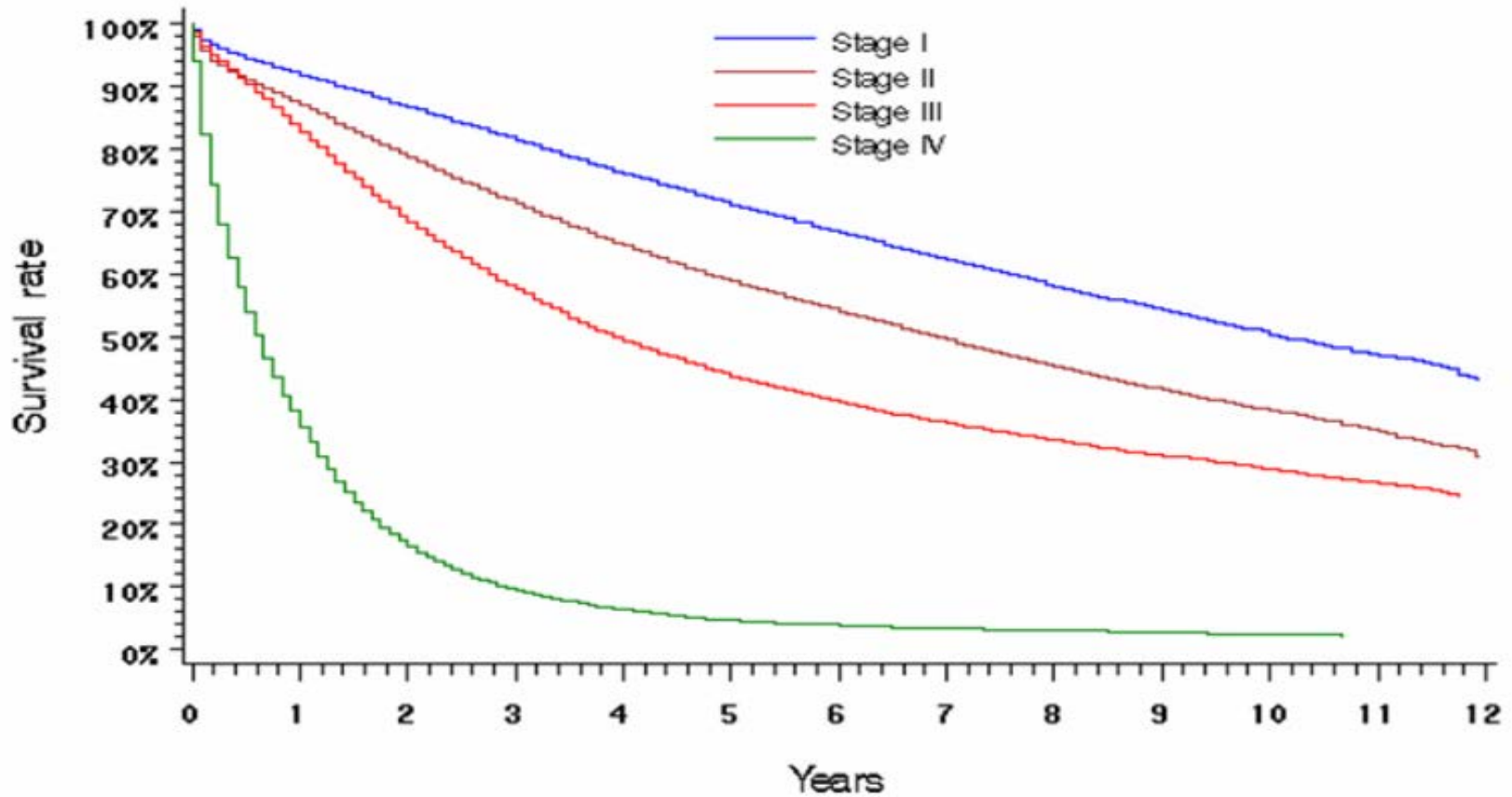


Colo-rectal Cancer - Specific Survival Rate, Stratified by AJCC Stage

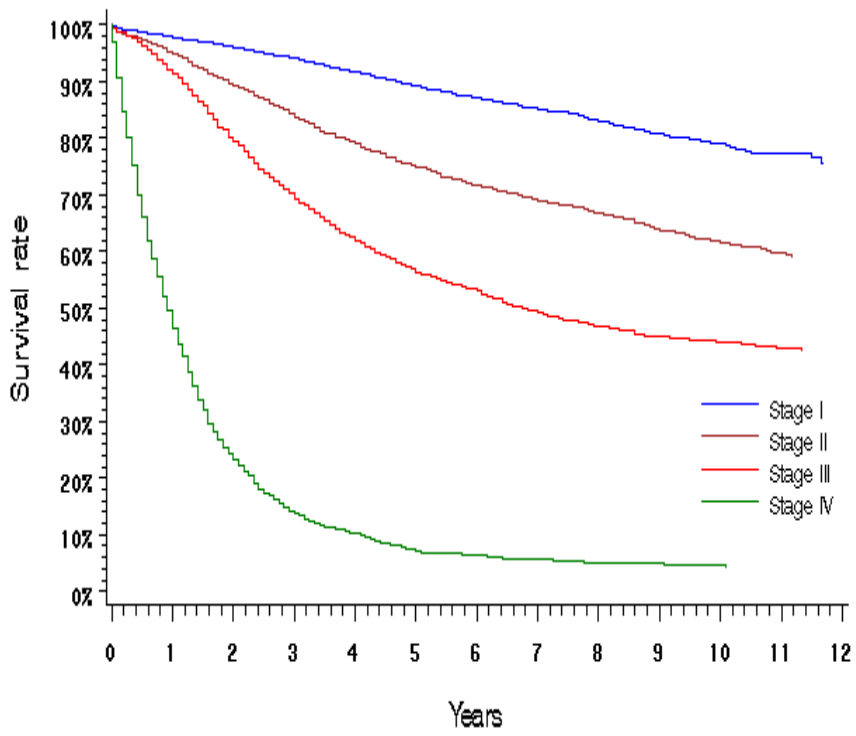


Effect of age

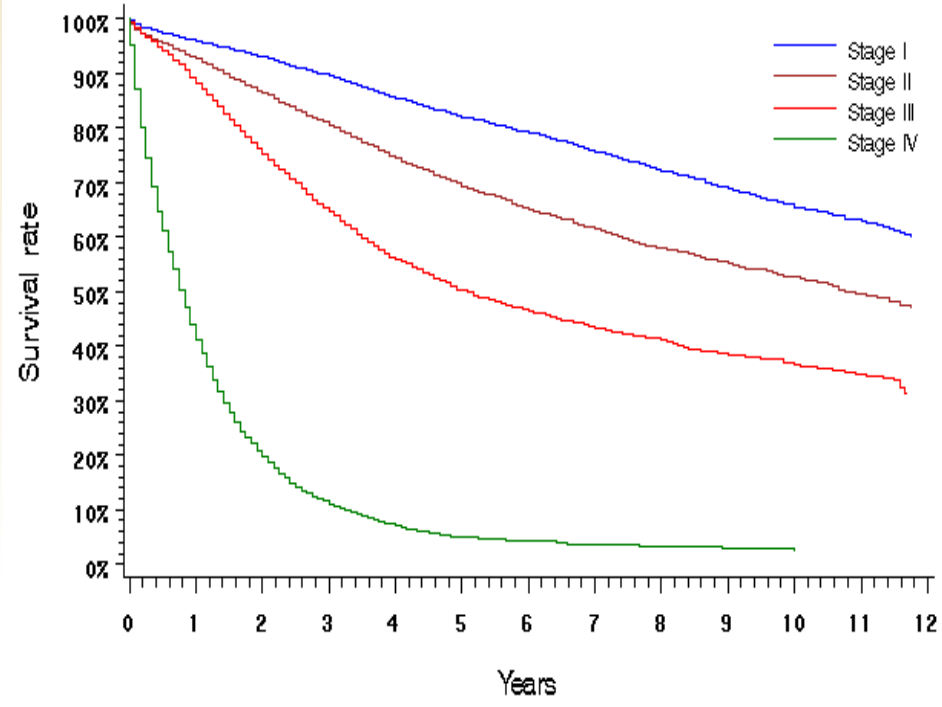
Colo-rectal cancer: Overall Survival Rate stratified by AJCC Stage



Overall Survival Rate Stratified by AJCC Stage
Age 50-59

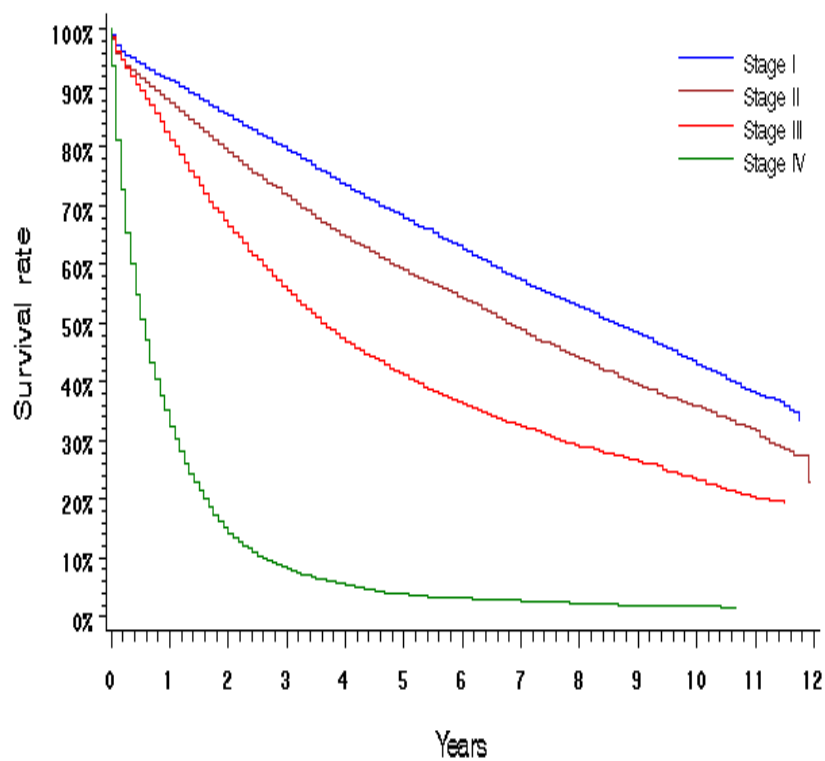


Overall Survival Rate Stratified by AJCC Stage
Age 60-69



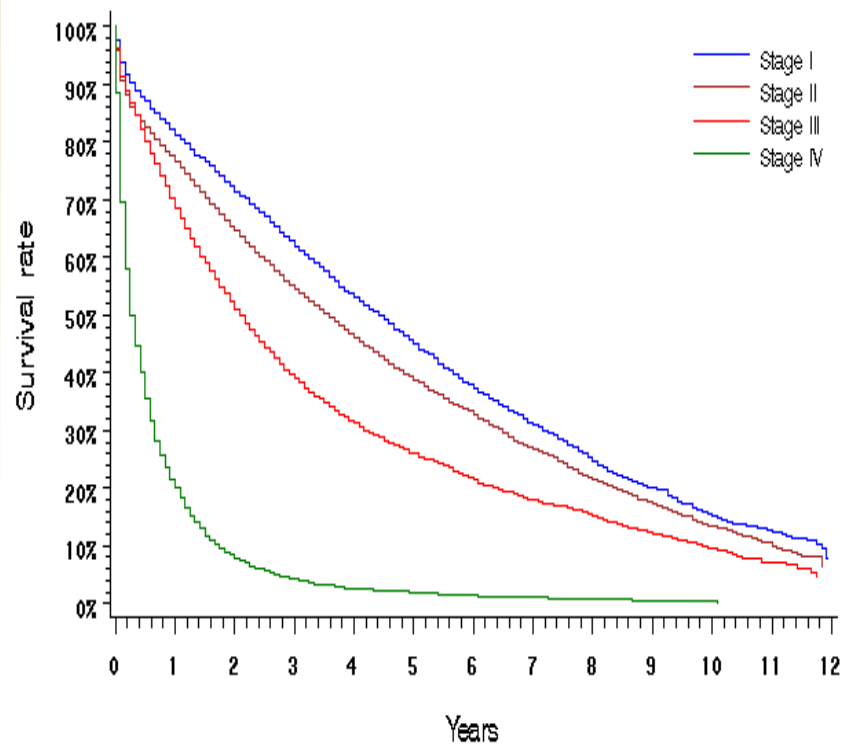
Overall Survival Rate Stratified by AJCC Stage

Age 70-79



Overall Survival Rate Stratified by AJCC Stage

Age 80+



Benefits and risks of screening colonoscopy

Benefits:

- The introduction of screening colonoscopy has been associated with reduction in incidence of and mortality from colon cancer.

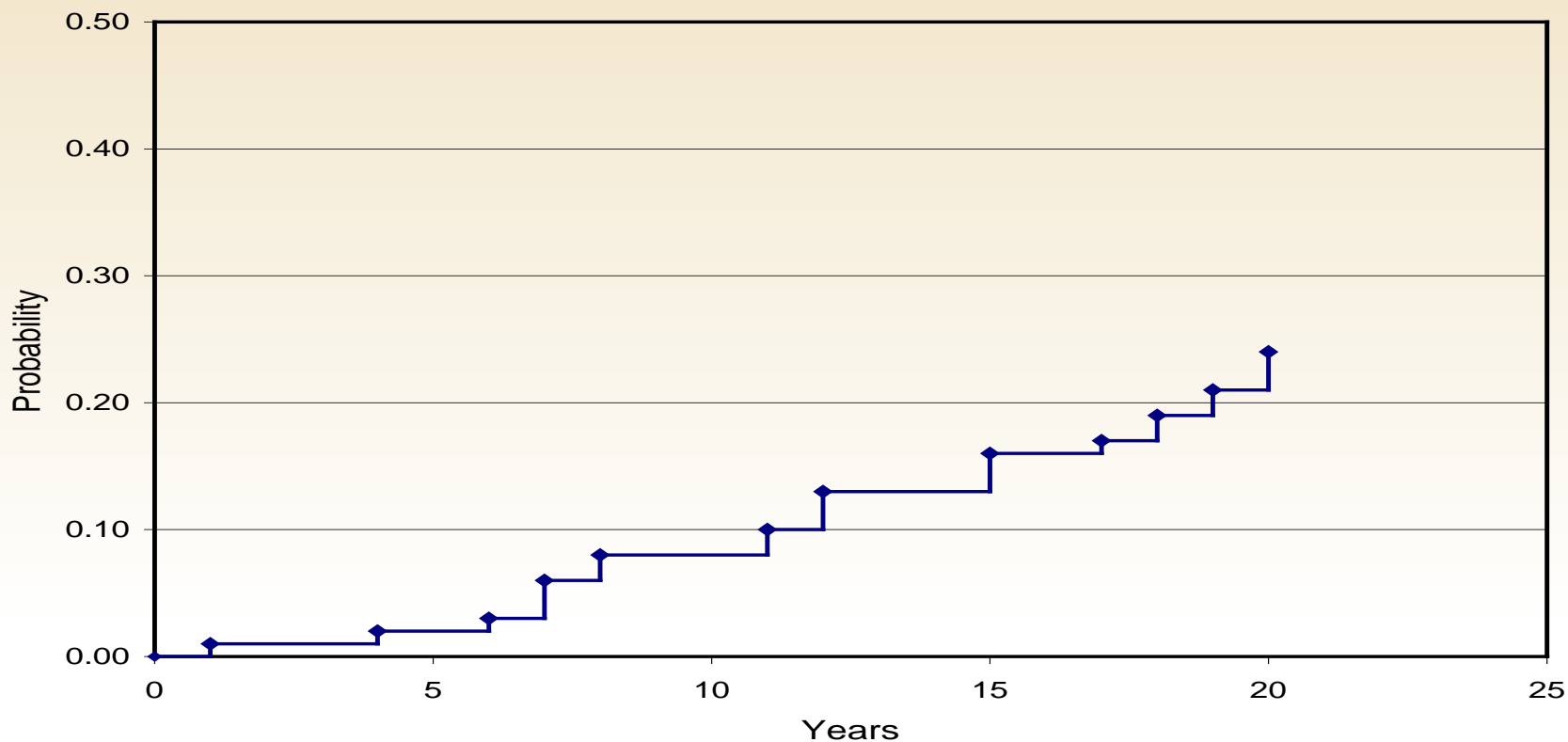
Risks:

- Created a cohort of “worried-well,” people with “pre-cancer.”
- 1 in 1000 screening colonoscopies result in hospitalization. 1 in 10,000 result in death.
- Major threat is too frequent use, resulting in increased toxicity with no additional benefit.

Screening and surveillance colonoscopy: recommendations on frequency

- **Normal Risk Individual:**
 - Start at age 50
 - Every 10 years until age 75
- **Surveillance for those with abnormalities:**
 - Hyperplastic polyps: 10 years
 - 1-2 small (<1cm) tubular adenoma: 5 years
 - 3-10 smaller or one large (>1cm) adenoma: 3 years
- **Post surgery for colorectal cancer:**
 - 1 year post surgery, then three years after that, then five years after that

Cumulative risk of cancer Dx during follow-up of unresected polyp ≥ 10 mm in size

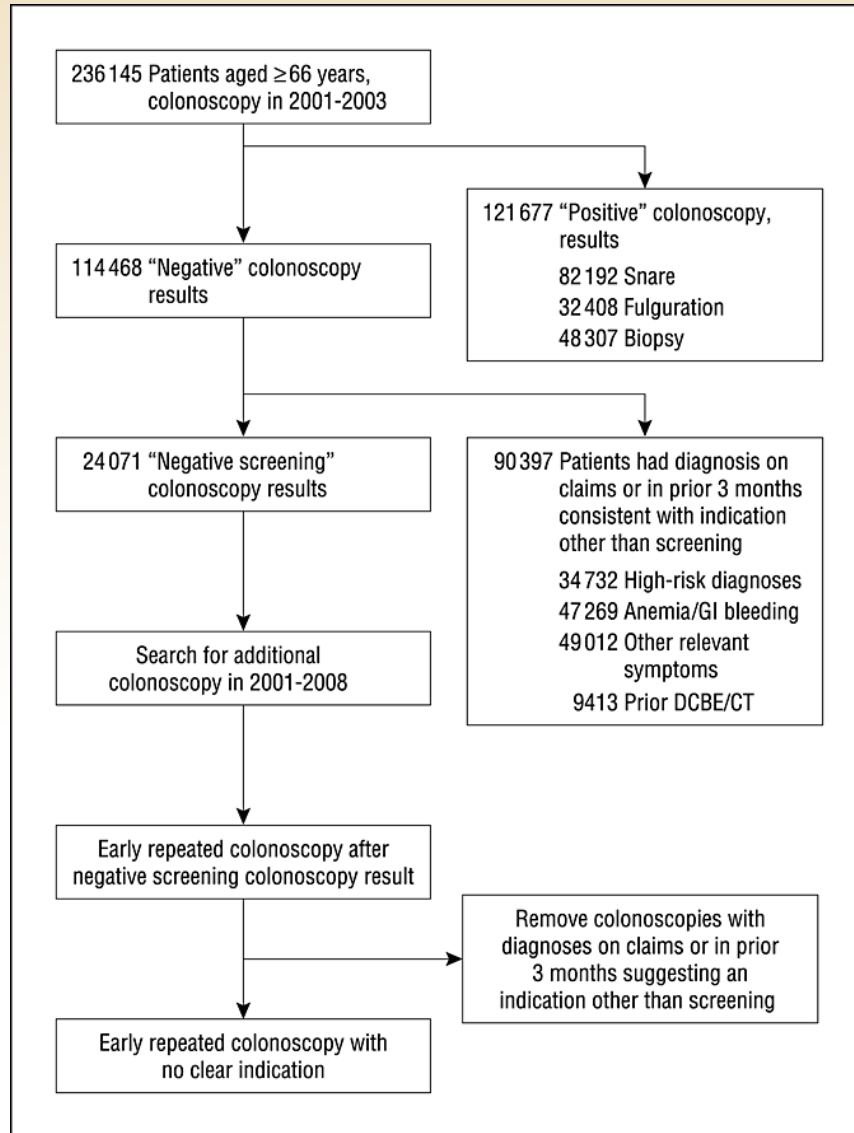


(Stryker et al. Gastroenterology 1987; 93:1009-13)

Background

- Most expert panels recommend repeat colonoscopy in 10 years in patients with normal colonoscopy
- Surveys indicate that many physicians recommend shorter screening intervals
- No population based data on over-utilization of colonoscopy

Schema for selection of study cohorts



Relevant diagnoses or procedures in the 3 months prior to repeated colonoscopy and indications for the repeated colonoscopy listed in the Medicare claims

Table 2. Relevant Diagnoses or Procedures in the 3 Months Prior to Repeated Colonoscopy and Indications for the Repeated Colonoscopy Listed in the Medicare Claim^a

Relevant Diagnoses and Procedures in the 3 mo Prior to Repeated Colonoscopy	Indication on Claim for Repeated Colonoscopy, No. (%)					
	Anemia/GI Bleeding (n=1252)	Other Relevant Diagnoses (n=906) ^b	High Risk Diagnoses (n=155) ^c	Unrelated Diagnoses (n=1955) ^d	Diagnoses Consistent With Screening (n=4340) ^e	All (n=8608)
Received DCBE/CT in 3 mo before the repeated colonoscopy	128 (10.2)	185 (20.4)	29 (18.7)	223 (11.4)	282 (6.5)	847 (9.8)
Diverticulitis in 3 mo before the repeated examination	21 (1.7)	46 (5.1)	5 (3.2)	90 (4.6)	82 (1.9)	244 (2.8)
Anemia/GI bleeding in 3 mo before the repeated examination	766 (61.2)	208 (23.0)	50 (32.3)	516 (26.4)	765 (17.6)	2305 (26.8)
Other relevant symptoms in 3 mo before the repeated examination	369 (29.5)	626 (69.1)	53 (34.2)	644 (32.9)	1059 (24.4)	2751 (32.0)
Probably indicated	887 (70.8)	710 (78.4)	155 (100)	0	0	1752 (20.3)
Possibly indicated	365 (29.2)	196 (21.6)	0	1024 (52.4)	1615 (37.2)	3200 (37.2)
Without indications	0	0	0	931 (47.6)	2725 (62.8)	3656 (42.5)

Abbreviations: DCBE/CT, double-contrast barium enema/computed tomography; GI, gastrointestinal tract.

^aThe distribution of relevant diagnoses and procedures in the 3 months before the repeated colonoscopy and the distribution of indications for the repeated colonoscopy listed on the Medicare claim (n = 8608).

^bOther relevant diagnoses include abdominal pain, diarrhea, constipation, ischemic bowel disease, irritable bowel syndrome, change in bowel habits, hemorrhoids, and weight loss. See the eAppendix (<http://www.archinternmed.com>) for specific codes.

^cHigh-risk diagnoses include inflammatory bowel disease (17.6%), history of colon cancer (64.0%), and others (18.4%).

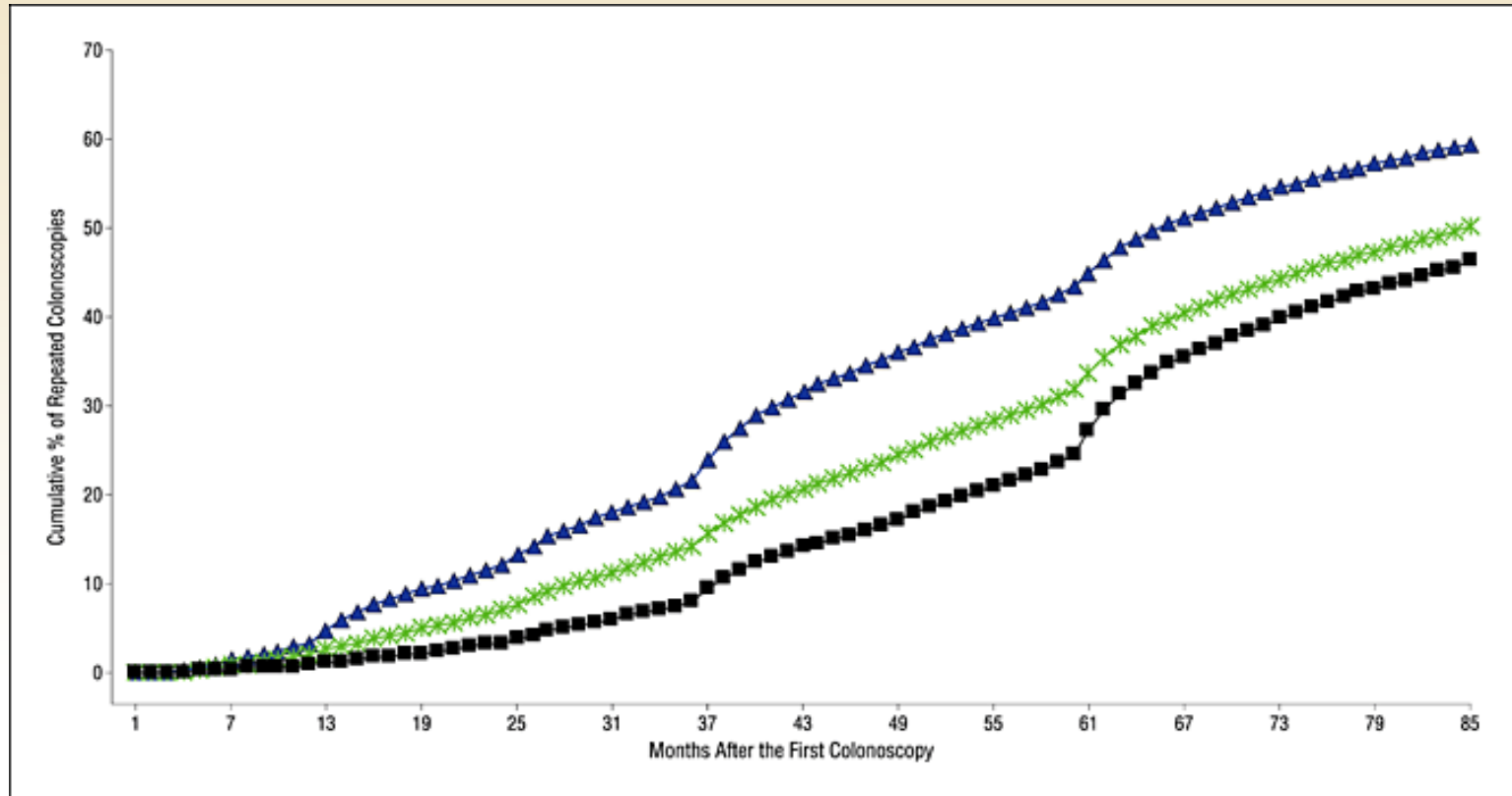
^dUnrelated diagnoses included diverticulosis (81.2%), diagnoses or symptoms related to the upper GI (5.8%), unspecified functional GI disorder (5.2%), and other (7.8%). Diverticulosis is not an indication for colonoscopy, except as a follow-up examination after acute diverticulitis, or with bleeding. Of the patients in this group, 90 had a prior diagnosis of diverticulitis.

^eThe major diagnoses under codes consistent with screening are benign neoplasm of colon/rectum (54.2%), history of colonic polyps (24.5%), screening for colon cancer (10.7%), and family history of GI cancer (7.4%).

(Goodwin, J. S. et al. Arch Intern Med 2011;171:1335-1343)

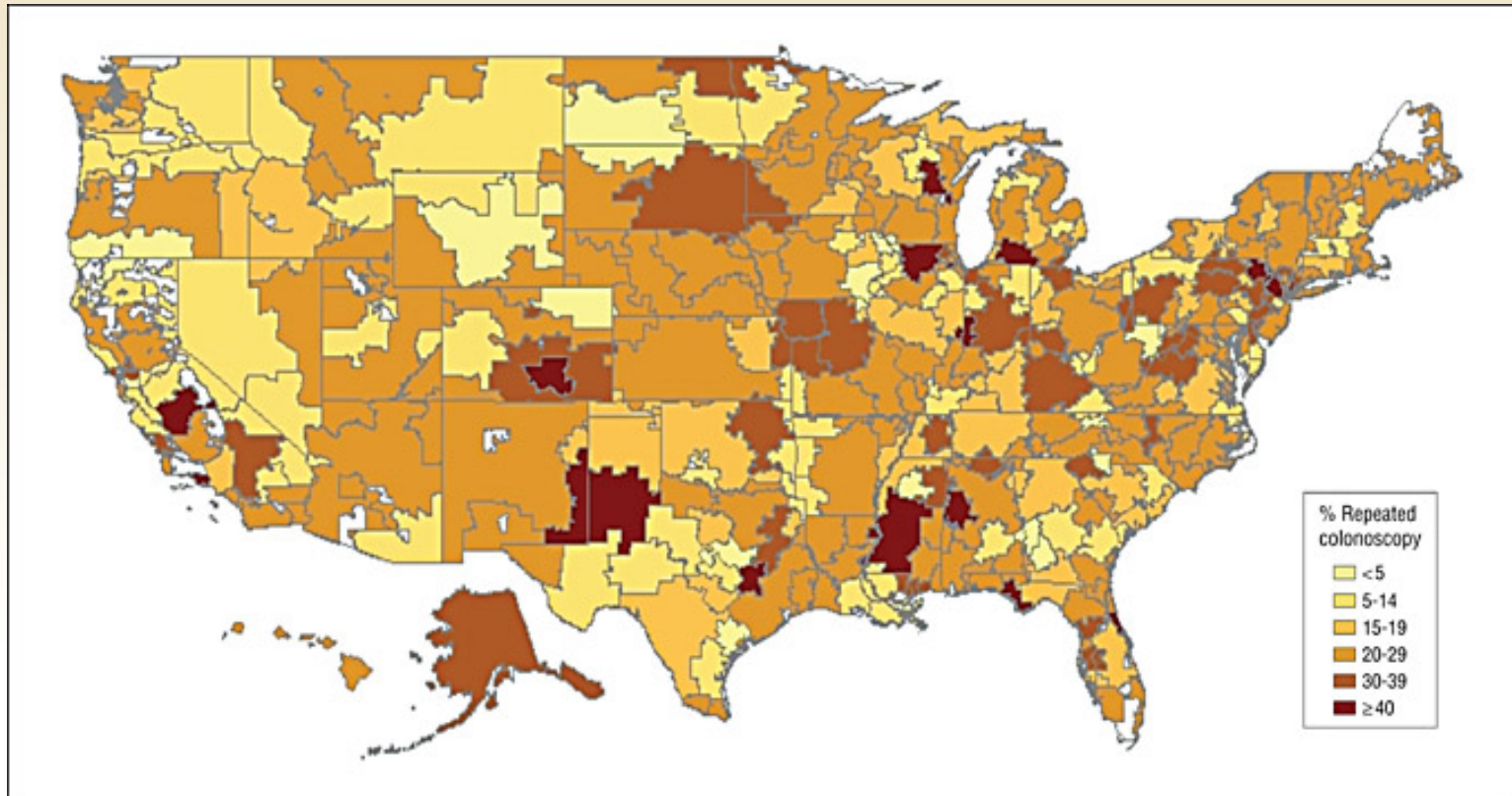
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Cumulative percentage of repeated colonoscopies for patients 66 years or older who underwent a colonoscopy between 2001 and 2003



(Goodwin, J.S. et al. Arch Intern Med 2011;171:1335-1343)

Percentage of Medicare fee-for-service who underwent early repeated colonoscopy with no clear indication, by health referral region



(Goodwin, J. S. et al. Arch Intern Med 2011;171:1335-1343)

Provider characteristics associated with early repeat colonoscopy without clear indication.

<u>Specialty</u>	<u>Odds of early repeat (95% CI)</u>
GI	1.00
Surgeon	1.09 (1.00, 1.18)
Other/Unknown	1.15 (0.98, 1.30)
<u>Place of Service</u>	
Hospital	1.00
Office	1.16 (1.01, 1.34)
Ambulatory Center	0.95 (0.88, 1.04)
<u>Volume</u>	
<440	1.00
441-740	1.12 (1.01, 1.24)
741-1180	1.14 (1.03, 1.27)
>1180	1.44 (1.31, 1.59)

(Multivariable analysis controlling for patient and geographic characteristics)

Provider level analyses of receipt of CRC Screening

1. Role of PCP in ethnic disparities in CRC screening (underutilization) (Singal et al HSR 2012)
2. Role of colonoscopy provider in over utilization of colonoscopy (Sheffield et al, submitted)

Approach

- 100% Texas Medicare files 2000-2009
- Identify patients “up to date” in CRC screening in 2009
 - Fecal occult blood test in 2009
 - Sigmoidoscopy or double contrast barium enema in 2005-2009
 - Colonoscopy in 2000-2009
- Assess black/white and Hispanic/non-Hispanic white differences in being up to date, and effect of having a PCP and PCP characteristics

The association of having a primary care physician on black versus white and Hispanic versus white odds of being up to date in colorectal cancer screening

Comparison	Entire cohort aged 66-75		Cohort aged 74-75	
	No PCP (n = 303,013)	Any PCP (n = 357,289)	No PCP (n = 39,605)	Any PCP (n = 54,674)
Black versus White	0.65 (0.63, 0.67)	0.89 (0.86, 0.91)	0.55 (0.50, 0.59)	0.73 (0.67, 0.79)
Hispanic versus White	0.58 (0.56, 0.59)	0.79 (0.68, 0.71)	0.51 (0.48, 0.55)	0.57 (0.54, 0.61)

†All models were adjusted with beneficiary age, gender, comorbidity, % black, % Hispanic, and median income of the zip code

Effect of primary care physician characteristics (n = 11,448) on the racial disparity in colorectal cancer testing by multilevel analysis

Characteristic

Beneficiary race (black vs. white)	0.95 (0.92, 0.98)
Beneficiary race (Hispanic vs. white)	0.80 (0.78, 0.82)
PCP gender (Female vs. Male)	1.12 (1.08, 1.16)
PCP U.S. trained (Yes vs. No)	1.10 (1.06, 1.14)
%White patients in PCP panel (per 10% increase)	1.05 (1.04, 1.06)

*All models were adjusted with beneficiary age, gender, comorbidity, % black, % Hispanic, and median income of the zip code.

Adjusted rates of being up to date with colorectal cancer screening by ethnicity, for the entire cohort, for those with a primary care physician, and for those with a primary care physician adjusted for clustering within primary care physicians

	Whole cohort		Those with a PCP [†] (Stratified Model)		Those with a PCP [†] (Multilevel Model)	
Beneficiary number	660,308		357,289		264,066[‡]	
	Adjusted Rate (%, 95%, CI)	Diff. from Whites	Adjusted Rate (%, 95%, CI)	Diff. from Whites	Adjusted Rate (%, 95%, CI)	Diff. from Whites
White	50.4 (50.2, 50.5)		59.9 (59.7, 60.1)		57.7 (57.3, 58.1)	
Black	43.4(42.9, 43.9)	7.0	57.0 (56.3, 57.7)	2.9	56.7 (55.7, 57.6)	1.0
Hispanic	39.5 (39.1, 39.9)	10.9	51.0 (50.5, 51.5)	8.9	51.9 (51.1, 52.7)	5.8

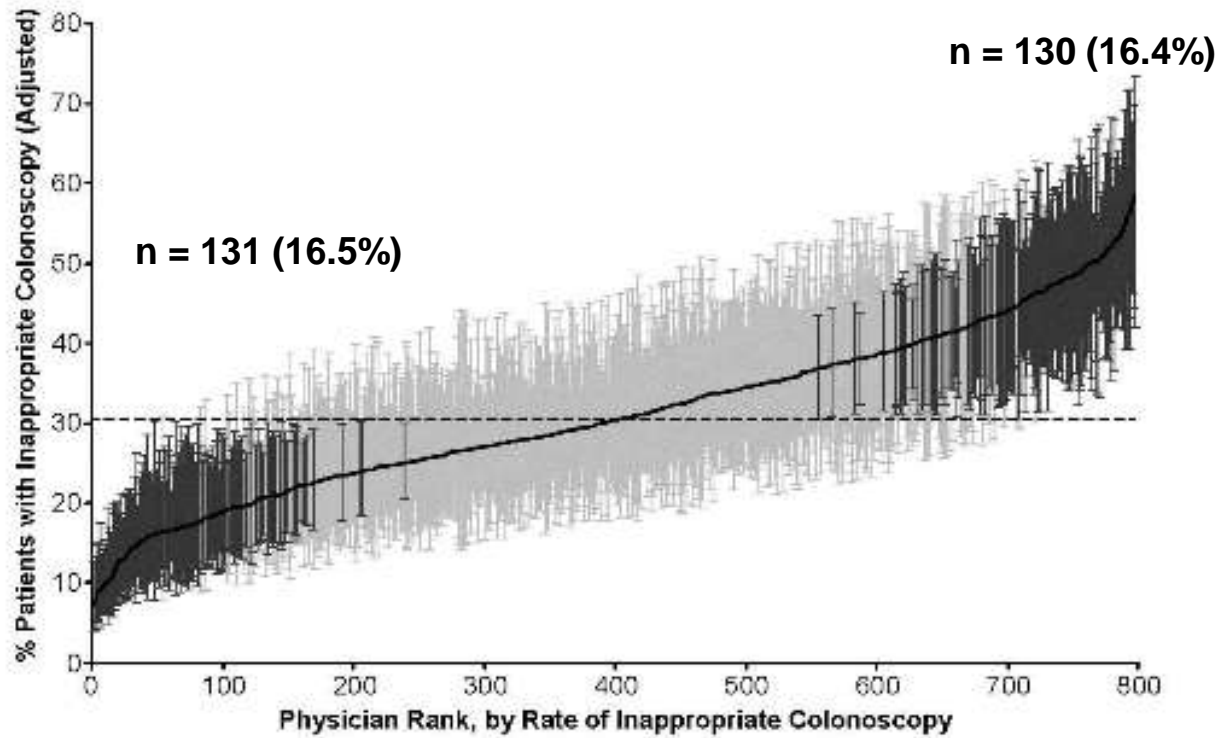
Next: Role of the colonoscopy provider in overuse of screening colonoscopy

Methods

- Identify Texas Medicare recipients aged 70+ who received colonoscopy in 10/1/08 to 9/31/09.
- Identify those colonoscopies judged to be potentially inappropriate.
 - Early repeat screening
 - Age 75+ screening
- Examine the percent of potentially inappropriate colonoscopies as a percent of all colonoscopies for each provider

Results

- Overall percent of potentially inappropriate colonoscopies
 - 12.0% in those 70-75
 - 50.2% in those 70-85
 - 46.8% in those ≥ 85
- In multilevel analyses, Hispanic patients (OR=1.73) and women (OR=1.22) were more likely to undergo potentially inappropriate colonoscopy
- There was substantial variation in percentage of patients who underwent inappropriate colonoscopy by colonoscopy provider and by geographic area (in Texas) 24



Comparison of physician characteristics in high and low rate groups

Variables	Physicians with low rate of inappropriate colonoscopy (n = 131)	Physicians with high rate of inappropriate colonoscopy (n=130)	P value
Sex			
Male	121 (92.4)	121 (93.1)	0.82
Specialty			
Gastroenterology	118 (90.1)	95 (73.1)	0.003
Surgery	4 (3.1)	26 (20.0)	
Generalist	9 (6.9)	6 (4.6)	
Other	0 (0.0)	3 (2.3)	
Year of medical school graduation			
<1980	41 (31.4)	30 (23.1)	0.42
1980-<1990	37 (28.2)	35 (26.9)	
1990-<2000	40 (30.5)	44 (33.8)	
2000+	13 (9.9)	21 (16.2)	
Location of medical school			
United States	91 (69.5)	77 (59.2)	0.08
Outside of United States	53 (40.8)	40 (30.5)	
Colonoscopy volume (mean, s.d.)	120.1 ± 62.9	106.8 ± 68.8	0.02

Percent of potentially inappropriate colonoscopies by health service area (HSA)

